OIPE IAP13
DEC 22 2005
PATENT & TRADEMARK OFFICE

Atty Dkt 213407.00011

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
MARTIN D. NATHANSON, ET AL.	)	Examiner: S. Nguyen
Application No.: 09/556,289	)	Group Art Unit: 2665
Filed: April 24, 2000	)	Confirmation No.: 7243
For: VEHICULAR TELEMETRY	)	

Mail Stop **AMENDMENT**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF MARTIN NATHANSON AND FREDERICK R. NADER UNDER 37 CFR § 1.131

We, Martin Nathanson and Frederick R. Nader, having respective post office addresses at 29 Southvale Drive, Toronto, Ontario, Canada, M4G 1G1, and 28382 Harwich, Farmington Hills, MI, USA, 48334, hereby declare and say as follows:

1. We are the original and only co-inventors of the subject matter disclosed and claimed in the above-identified U.S. patent application. We have reviewed the subject application and the June 23, 2005 Official Action in preparing this Declaration.

2. We conceived the subject matter of at least the inventions recited in independent Claims 32 and 37 prior to the January 30, 1998 filing date of U.S. Patent No. 6,360,257 to Rydberg et al., and prior to the January 15, 1998 filing

date of U.S. Patent No. 6,535,493 to Lee et al. Furthermore, we acted to diligently reduce to practice the subject matter of at least the inventions recited in independent Claims 32 and 37 from the conception thereof up to at least January 15, 1998. Moreover, from a date prior to January 15, 1988, we diligently continued to work to reduce to practice the subject matter of at least the inventions recited in independent Claims 32 and 37, and we aver that a constructive reduction to practice of that subject matter occurred at least as of the filing date of the subject application on April 24, 2000.

3. Enclosed as Exhibit A are copies of disclosure materials describing the conceived inventions recited in independent Claims 32 and 37. These materials were created prior to January 15, 1998, and establish that the invention was conceived prior to January 15, 1998. These materials also provide evidence that the invention was being diligently reduced to practice from the conception thereof up to at least January 15, 1998.

4. Exhibit A describes a method of exchanging data between a vehicle and at least one data exchange site, comprising the steps of:

providing the vehicle with a communication unit configured to collect vehicle operational data from selected components thereof and to exchange data with the data exchange site; and

providing the vehicle with a transmitter and receiver capable of transmitting and receiving messages under an SNMP protocol, to transmit messages representative of the vehicle operational data to the data exchange site. (See Claim 32.)

5. Exhibit A also describes A system for transferring data between a vehicle and a data exchange site, comprising:

(i) a communication unit located onboard the vehicle to collect vehicle operational data from selected components of the vehicle and to exchange data with the data exchange site under an SNMP protocol, the communication unit including an interface to an IEEE 802.11 data link;

(ii) an IEEE 802.11 Access Point acting as an IPv6 router and a foreign mobility agent for the communication unit; and

(iii) an interface to a non-wireless subnetwork to route mobile-terminated traffic through the IEEE 802.11 Access Point for the communication unit to exchange vehicle operational data with the data exchange site. (See Claim 37.)

6. Therefore, it is evident that the present application claims inventions that were conceived of and being diligently reduced to practice prior to January 15, 1998.

7. We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such wilful false statements may jeopardize the validity of the application or any patent issued thereon.

Martin Nathanson

December 18, 2005

Date

Frederick R. Nader

Date

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3. Enclosed as Exhibit A are copies of disclosure materials describing the conceived inventions recited in independent Claims 32 and 37. These materials were created prior to January 15, 1998, and establish that the invention was conceived prior to January 15, 1998. These materials also provide evidence that the invention was being diligently reduced to practice from the conception thereof up to at least January 15, 1998.

4. Exhibit A describes a method of exchanging data between a vehicle and at least one data exchange site, comprising the steps of:

providing the vehicle with a communication unit configured to collect vehicle operational data from selected components thereof and to exchange data with the data exchange site; and

providing the vehicle with a transmitter and receiver capable of transmitting and receiving messages under an SNMP protocol, to transmit messages representative of the vehicle operational data to the data exchange site. (See Claim 32.)

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Martin Nathanson — **Date**

Frederick R. Nader — 22 December, 2005

Frederick R. Nader — **Date**

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EXHIBIT A

OIPE IAP13
DEC 29 2005
PATENT & TRADEMARK OFFICE

From: Martin Nathanson <martinn@smtp.Generation.NET>
To: TOR4.MCTET2(SHOWE)
Date: [redacted]:28pm
Subject: Patent

Attached are three (3) background documents. They are in Micrososft Word 7 format. In case you have difficulty with this, I have also included ASCII text versions.

The first two refer to our Mobile Automotive Telemetry System (MATS), as developed for the heavy equipment market. By the way, in case you were not aware (as I was not) that when people in the industry use the term "automotive market", they specifically means passenger cars. This is what we are targeting for the patent.

(1) MATSDATA.DOC is basically a data sheet describing the hardware and software components of the system. I am mailing you a glossy product sheet with the retainer check.
(2) MATSDESC.DOC describes the essential characteristics of the system which should interest an OEM (truck manufacturer).

The third document was written last night and this morning and constitutes a initial draft of a technology description for the patent application, that I hope will allow you to orient yourself. Please note that I have not had any chance at all to talk to my partner who handled all the hardware and operating system software issues, so there is probably a lot more to follow on these subjects. He has extensive experience in studying patent documents and should be able to help me get very "focused".

Martin

obd-tt

Universal On-Board Diagnostic Server

The universal on-board diagnostic (U-OBD) server is a vehicular computer which provides remote access to on-board diagnostic data through a variety of communications channels. The U-OBD server maintains a database of automotive functions objects which record performance data and respond to requests for information from authourized clients.

Purpose

To provide universal, real-time, flexible accessibility to automotive on-board diagnostic (OBD) data and to ensure full Internet connectivity to any part of the vehicle, including a portable computing device.

Client/Server Architecture

The embedded software in the ETC is structured according to an object-oriented client-server model which allows all monitored automotive functions to appear as through they are local to the remote client device. Remote clients interface to an API (Application Programming Interface) which provides a well-defined set of function calls for the following capabilities:

* Configuration of the U-OBD server to establish acceptable threshold values for each automotive function. When these thresholds are exceeded, the server creates alarm objects which stream and transmit themselves to the client.
* Retrieval of automotive function data. The server can be requested to create and transmit reports for specific functions at user-defined intervals and for user-defined durations.
* Registration of client processes to be notified when alarms and reports are received from the U-OBD server.

Process Architecture (This section is subject to modification)

The process architecture defines the active objects (threads or polled functions) running within the firmware embedded in the U-OBD server. The threads related to communications shall be detailed in a subsequent version of this document. The primary active object which is unique to the U-OBD server is the monitor object provides the interface to both the OBD-2 Diagnostic Protocol and the DSP module and assures a real-time flow of diagnostic information from these interfaces to client objects which have expressed their interest in this information.

Communications Architecture

Internet Telemetry

In order to provide a universal communications channels from any client to any mobile U-OBD server, the technology uses the Internet paradigm coupled with sub-network drivers to interface to whichever packet-switched mobile data communications networks for which the U-OBD is equipped with hardware access devices. (See Sub-network Datalinks).

The embedded communications software therefore incorporates an object-oriented implementation of the complete Internet protocol suite, including IP(version 4), TCP, UDP, IGMP. ICMP, SNMP and PPP.

IP Defines the packet switching framework for datagrams (packets) over the Internet. IP determines whether a datagram should be forwarded (routed) from one computer to another, given the destination address encapsulated in the datagram, or has reached its final destination.

TCP Transport Control Protocol. Provides reliable data delivery between two end points (nodes in the Internet)

UDP User Datagram Protocol. Defines framework for (unreliable)delivery of individual IP datagrams

IGMP Internet Group Message Protocol. Defines abstract method for multicast or broadcast from a single origin to multiple destinations. Useful when the same message needs to be sent to an entire fleet. It is therefore desirable to avoid the cost of re-transmission of the same message to each and every mobile unit

This works only in the case where the underlying network technology supports this and provides an advantageous rate structure for group messaging. For instance, this is the case with Ericsson Mobitex.

ICMP Internet Control and Message Protocol. Defines a set of control and error messages. In particular, ICMP allows routers to report failures to reach destinations and indicate to the originator of the datagram, the reason for the failure. This is critical in networks with mobile nodes which frequently fall into and out of "reachability".

SNMP Simple Network Management Protocol. In conventional TCP/IP networks or the Internet, this provides for network administrators to have remote access to traffic statistics in routers and to remotely update address tables in routers. Examples of

applicability are where OE manufacturers or the management of a large end-user fleet want to add additional sites from which TCP connections with (or SCADA services from) mobile units can be established. This means that the corporate computing network is expanding and the job of a network administrator is to ensure that the computers responsible for routing traffic are aware of the address of new sites in order to properly route new traffic destined for these site. SNMP is used to accomplish this. The on-board computer must therefore "speak" SNMP in order to be kept abreast of new entities in the corporate network with which it can communicate.

PPP Point-to-point protocol. Used for serial connections between permanent Internet nodes and temporary nodes which "live" on the Internet for the duration of the connection. Typically applies to the protocol between a personal computer and an Internet service provider over a telephone link. MATS uses this for connection between lap-tops or hand-held computers and the Engine Telemetry Computer, where the latter is the permanent Internet node.

Note that the IP implementation incorporates a Router object which, assisted by innovations introduced in the ICMP implementation, is capable of identifying the least-cost route to a specific mobile unit when that server interfaces to more than one mobile data network. Furthermore, the IP implementation is for version 4 whereas the Internet Engineering Task Force (IETF) has recently adopted a new version which provides more support for mobility and dynamic routing to mobile Internet nodes. Implementation of this new version shall be incorporated in a second generation of the U-OBD technology.

Sub-network DataLinks

The sub-network datalinks are the drivers for each specific packet-switched mobile data technology for which the U-OBD server has a network access device (radio modem). The datalinks currently supported are Mobitex (Ericsson) and ARDIS (Motorola). Support for the ORBCOMM system (low-earth orbit satellite, VHF, data-only) is pending.

InfraRed

The U-OBD server incorporates a full implementation of the IrDA (Infrared Data Association) specification. This is a complete protocol stack, including a datalink layer IrLAP (Link Access Protocol), a sub-network layer IrLMP (Link Multiplexing Protocol) and SNMP-like protocol called IAS (Information Access Service). Each of these has been implemented as an object -oriented class derived from a base class which is shared with some other entity within the communication system.
The use of the entire IrDA stack is the basis for enabling the wireless, universal connectivity in the garage as described in the following section. However, at the same time, the IrLAP implementation is also a means of provided a wireless datalink for a PPP connection between the U-OBD server and a IrDA-enabled hand-held or portable

computing device with Internet software. In this wy the U-OBD server also acts as an mobile Internet router/service provider.

Data Acquisition Links

OBD-2 Diagnostic Protocol (This section is subject to extensive modification)

OBD-2 Diagnostic Protocol is an SAE (Society of Automotive Engineers) standard for data retrieval from vehicular electronic control modules (ECM's). In addition to providing access to performance data via remote telemetry, the U-OBD server also provides a wireless IR (InfraRed) solution to the problem of heterogeneous physical interfaces (connectors and electrical signals) between the ECM's and diagnostic tools of various manufacturers. By implementing the OBD-2 diagnostic protocol as a datalink between itself and the ECM, the U-OBD server can offer transparent services to the diagnostician (mechanic) using the information access service (IAS) protocol of the IrDA (Infrared Data Association) specification. This achieves the following:

* eliminates the need for cabling connections with vehicular computers for uploading of information in the garage.

* capitalizes on the expected widespread availability of new hand-held computing devices based on Microsoft's Windows CE (Computer Electronics) operating system. CE is a version of Windows specifically designed for these devices. Both the CE software and the devices comply with the IrDA specification for standardized datalinks between computers, laptops, handhelds, printers, modems and cellular phones via infrared serial ports integrated into the hardware.

* by enabling vehicular computers to upload their accumulated diagnostic data to an IrDA-compliant PDA (personnel digital assistant), a wide variety of additional possibilities becomes apparent. Since the PDA's are so ubiquitous, many passenger car owners will own, and frequently carry with them, such devices. Furthermore, it will become more and more common for these devices to have integrated cellular phone modems or (packet radio modems) and to see them being used in conjunction with cellular phones. Therefore diagnostic information can be acquired by the car owner through the IR port in the PDA and transferred via modem to the garage, if required.

NMEA

Nation Marine Electronic Association is a protocol standard for exchange with a external GPS receiver. The NMEA is embedded in the U-OBD server in order to enable location services for a client as well as to attached location stamps to data reports and alarms.

Analog and Digital Signal Processing

The U-OBD server can be configured with a bank of analog and digital signal inputs for sensors not connected to an ECM. A digital signal processing (DSP) software module handles these inputs and relays them to the active monitor object.

Hardware

(See Product Description). After allocation of three(3) RS-232 ports to the GPS receiver, radio modem and a satellite transceiver or cellular modem, one port remains for user access through an infrared link. The ETC (Engine Telemetry Computer) therefore incorporates an IrDA-compliant IR adapter for the spare serial port.

Matsdata.txt

MOBILE AUTOMOTIVE TELEMETRY SYSTEM
Product Description

The primary features of the AMT Mobile Automotive Telemetry System are:

* an on-board vehicular device which supports automotive sensor input and GPS
* communications which is independent of the underlying radio network
* Windows NT Base Station.

Hardware

Engine Telemetry Computer (ETC)

* CPU
* 16 analog input
* 16 digital inputs
* 2 RS-232 ports

These are for user applications such as dispatching messaging to terminals in the cab. The external device can communicate with the ETC using TCP/IP and PPP (point-to-point protocol) and can therefore be addressed in Internet fashion by the Base Station or any other device using the Base Station as an Internet Protocol router.

* 2 RS-485 ports

These are to support the SAE (Society of Automotive Engineers) J1708 standard for data acquisition and control on board trucks and buses.

* GPS receiver
* Radio network access device

The ETC is designed to meet the harsh environmental, mechanical and electrical requirements of an automotive application.

* -30 (C/ +60 (C operating temperature
* designed for compliance with SAE (Society of Automotive Engineers) J1211 (recommended environmental practices for electronic equipment)
* designed for compliance with SAE J1113 (conducted and radiated susceptibility)
* 10,000 hrs MTBF

Base Station

* Windows NT Computer

Software

Engine Telemetry Computer

The software in the ETC is an entirely object-oriented design and implemented in C++. It consists of:

* Intelligent digital signal processing module
* SCADA (Supervisor Control and Data Acquisition) Server
* TCP/IP protocol stack for wireless communications
* Data privacy: where required, optional communications encryption is available (subject to export regulations).

Together, these software components allow for the following capabilities of the ETC:

* can be remotely configured by the Base Station
* can report automotive and operational events to the Base Station
* can route wireless data traffic to and from other computing devices in the vehicle

Base Station

The Base Station software is an entirely object-oriented design and implemented in C++. It consists of:

* SCADA client
* OODBS (object-oriented database system)
* TCP/IP protocol stack for wireless and LAN communications

These software components allow the Base Station to act as a client with respect to the ETC's, The Base Station may :

* remotely configure the ETC software
* request and receive ETC reports in real-time
* store ETC reports in the OODBS
* display real-time graphic representation of automotive functions monitored by the ETC
* alert third-party systems of ETC alarms using RPC's or Sockets.

MOBILE AUTOMOTIVE TELEMETRY SYSTEM
Product Description

Matsdesc.txt

Mobile Automotive Telemetry System
Executive Summary

The Mobile Automotive Telemetry System (MATS) is technology which grew out of the developers' experience with the application of mobile data communications to fleet operations. It was recognized that there is a need, common to all fleets, for real-time monitoring of all automotive functions which could enable preventive maintenance programs to be driven by alarm incidents from the field. Automotive telemetry, as it has been implemented, consists of an on-board vehicular computer which reports exception conditions to the maintenance garage and responds to any queries that a mechanic issues from a work station in the garage, even while the vehicle is on the road.

To achieve the communications link, MATS uses whatever mobile data facilities are most appropriate for the fleet in question, including public RF packet networks such as Ericsson's Mobitex or satellite systems such as ORBCOMM. The communications software architecture treats each of these as a physical "sub-network" according to the Internet model. (The prototype version of the ETC currently incorporates an access device - radio modem - for the Ericsson network). However, it is not simply a matter of following this model. MATS also incorporates an implementation of the Internet standards so that the on-board computer becomes Internet-addressable.

This means that packet-based Internet communications with the vehicle becomes possible for a wide variety of applications. In addition to the link between a fleet maintenance department and the vehicle, there is also the potential for the Original Equipment Manufacturer's product support staff to assist end-user customers with technical diagnoses or to validate dealer warranty claims through remote monitoring. Regulatory bodies responsible for commercial vehicle licensing and highway safety can carry out remote electronic inspections.

Furthermore, since there are many applications for mobile data exchange with the driver (eg. E-MAIL, dispatch, database query), the Engine Telemetry Computer (ETC) supports a PPP (point-to-point protocol) connection for portable or hand-held computing devices in the cab. This provides a TCP/IP communications platform to anywhere in the Internet in exactly the same fashion as does an Internet Service Provider (with the exception that the PPP link operates over a direct connection between the in-cab computer and the ETC instead of over a telephone line between the subscriber and the Internet Service Provider).

In order to provide for a comprehensive monitoring capability, the ETC has a bank of 16 A/D channels for sensor inputs, 16 digital (pulse) channels for discrete inputs (eg. tachometer, gear position, intrusion alarms) and RS-485 ports for interface to the SAE J-1708 data bus, in addition to the signal processing and J-1708 protocol software required to acquire various types of data. This hardware configuration is expandable to support both more inputs as well as discrete outputs for security applications.